

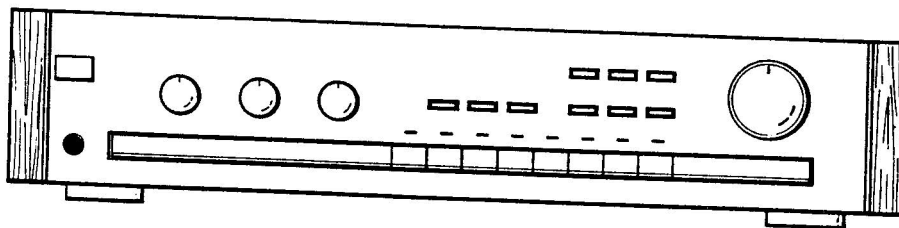
Lenco

SERVICE
MANUAL

LA-1500P

STEREO PRE AMPLIFIER

PA 3210



SPECIFICATIONS

Amplifier Section

Continuous Max. Output Voltage is 8 Volts Per Channel, Min., at 47 Kohms from 20Hz to 20kHz with no more than 0.02% total harmonic distortion.

- Input (Sensitivity/Impedance)
 - Phono 1, 2 2.5mV/47K Ω
 - Tuner, Aux/Video, CD, Tape 1, 2 Play 150mV/47K Ω
- Phono Overload Level (T.H.D. 0.1%, 1kHz) 200 mV
- Output (Level/Impedance)
 - Tape 1, 2 Rec 150mV/2.2K Ω
- Frequency Response
 - Phono 1, 2 (RIAA Equalization) 20Hz to 20kHz $\pm$ 0.5dB
 - Tuner, Aux/Video, CD, Tape 1, 2 Play 20Hz to 80kHz $\pm$ 3dB
- Tone Control
 - Bass (100Hz) $\pm$ 10dB
 - Treble (10kHz) $\pm$ 10dB
- Loudness Control (Volume Control set at -40dB Position) +7dB (100Hz), + 4dB (10kHz)
- Subsonic Filter 20Hz (-12dB/Oct)
- High Filter 8KHz (-12dB/Oct)
- Muting -20dB
- Hum & Noise (IHF, Short-Circuited, A Network)
 - Phono 1, 2 95dB
 - Tuner, Aux, CD, Tape 1, 2 Play 110dB

Miscellaneous

Power Requirements AC 220V, 50Hz
Power Consumption 30W
Dimensions 420(W) x 88(H) x 380(D)mm
Weight (without package) 5.9kg

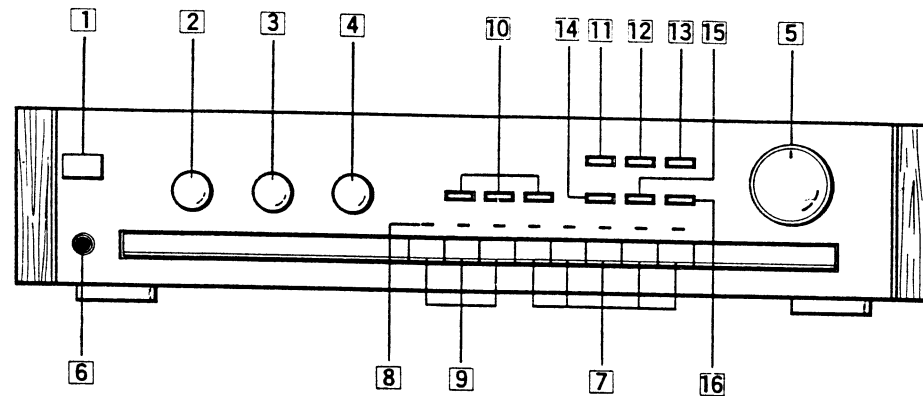
Furnished Parts

Operating Instructions 1
Connection Cord 1

Note:

- Specifications and design subject to possible modification without notice due to improvements.

FRONT PANEL FEATURES



1. POWER SWITCH

Press to ON position to turn on the pre-amplifier. Upon power up, a muting circuit presents a short delay in order to suppress the sometimes annoying sound present at switch-on.

2. 3. BASS AND TREBLE CONTROLS

Use these controls to adjust the bass and the treble. If you turn the bass control clockwise from its center position, you will be able to emphasize the sound in the low-frequency range. Conversely, turning the bass control counter clockwise from the center position, you will attenuate the sound.

Use the treble control to adjust the sound in the high-frequency range in the same manner.

4. BALANCE CONTROL

Use this control to balance the volume of the left and right channels.

5. VOLUME CONTROL

Use this control to adjust the output level to the speakers and headphones. Turn it clockwise to increase the output level. No sound will be heard if you set it to "0".

6. HEADPHONE JACK

Plug the headphones into this jack when you want to listen through your stereo headphones.

Be sure to turn down the volume level before plugging in the headphones. Turn up the volume level to a comfortable listening level once the headphones are adjusted.

7. FUNCTION SELECTOR

Use this selector to select the program source. When set, the function indicator above the panel corresponding to the position of the function selector will light up.

CD: Select when you wish to listen to a Compact Disc Player.

AUX: Select when listening to a program source which is connected to the AUX jacks.

TUNER: Select when listening to radio broadcasts from the tuner.

PHONO 1, 2: Select either Phono 1 or Phono 2 when playing a record on the corresponding turntable.

8. FUNCTION INDICATORS

The CD, AUX, TUNER, PHONO 1, 2 function indicators light up in accordance with the position of the function selector.

9. TAPE MONITOR SWITCH

Use these buttons to select the program source which is being reproduced.

TAPE 1: Select to monitor a recording or a tape being played back on the tape deck which is connected to the TAPE 1 jacks.

TAPE 2: Select to monitor a recording or a tape being played back on the tape deck which is connected to the TAPE 2 jacks.

OFF: Select whenever you are not playing back a tape or monitoring a recording.

10. TAPE COPY SWITCH

Use these switches when using two tape decks to copy recorded tapes or edit tapes. This switch is otherwise kept at the OFF position.

TAPE 1 ► 2: When playing back the tape on a deck connected to the TAPE 1 jacks and recording (copying) on a deck connected to the TAPE 2 jacks.

TAPE 2 ► 1: When playing back the tape on a deck connected to the TAPE 2 jacks and recording (copying) on a deck connected to the TAPE 1 jacks.

OFF: Set to this position when not copying.

11. MUTE SWITCH

Set this switch to -20dB to attenuate the audio output indicated by the volume control by 20dB.

12. SUBSONIC FILTER SWITCH

When depressed, the subsonic filter (20Hz cut-off) reduces turn-table rumble, record warp noise and other ultra low frequency noise.

13. LOUDNESS SWITCH

This compensates for human hearing characteristics by boosting the bass and treble response at low volume listening levels to achieve a more pleasing tone balance.

14. TONE SWITCH

Set this switch to ON when adjusting the bass and treble controls. When set to OFF, the tone control circuits are disengaged and frequency response is flat. This function is convenient for checking phono cartridge and speaker tone quality and listening room acoustics.

15. HIGH FILTER SWITCH

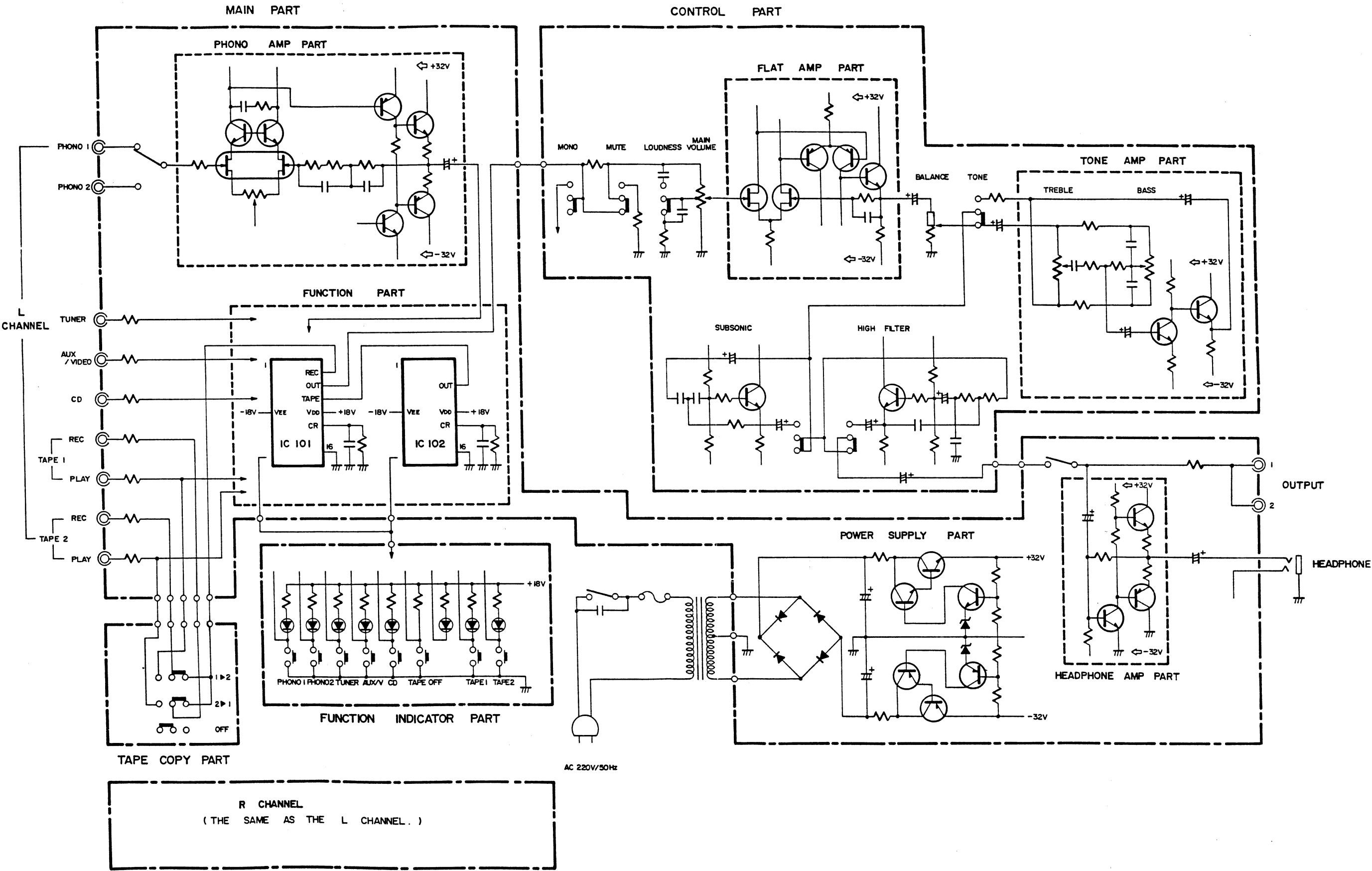
The high filter with a cut-off frequency of 8kHz is actuated when this switch is set to the 8kHz position.

The high filter serves to attenuate frequencies higher than 8kHz in a 12dB/oct slope. This is why it is effective in suppressing high-frequency noise or noise from scratches on records being played.

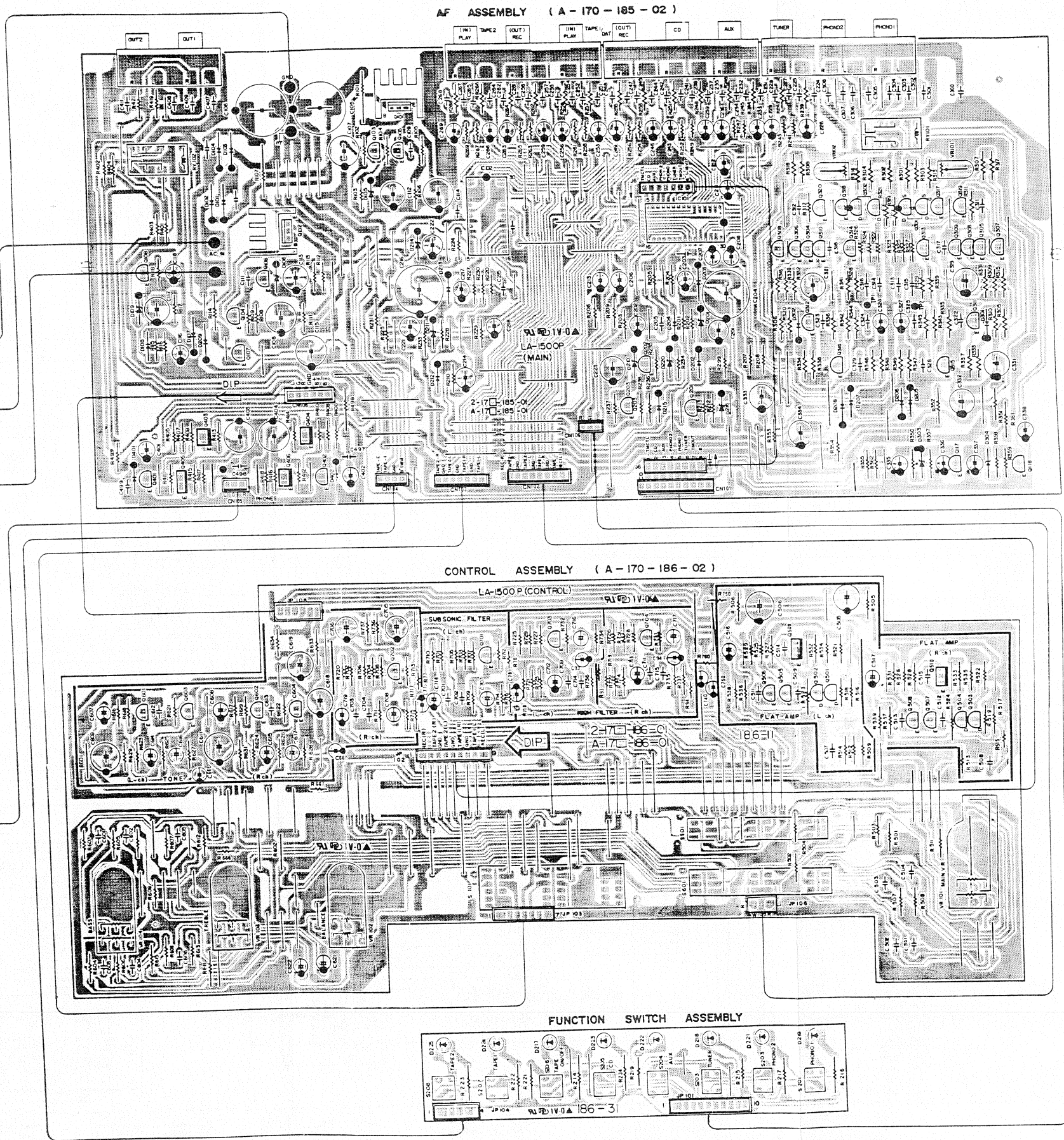
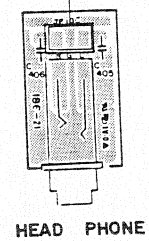
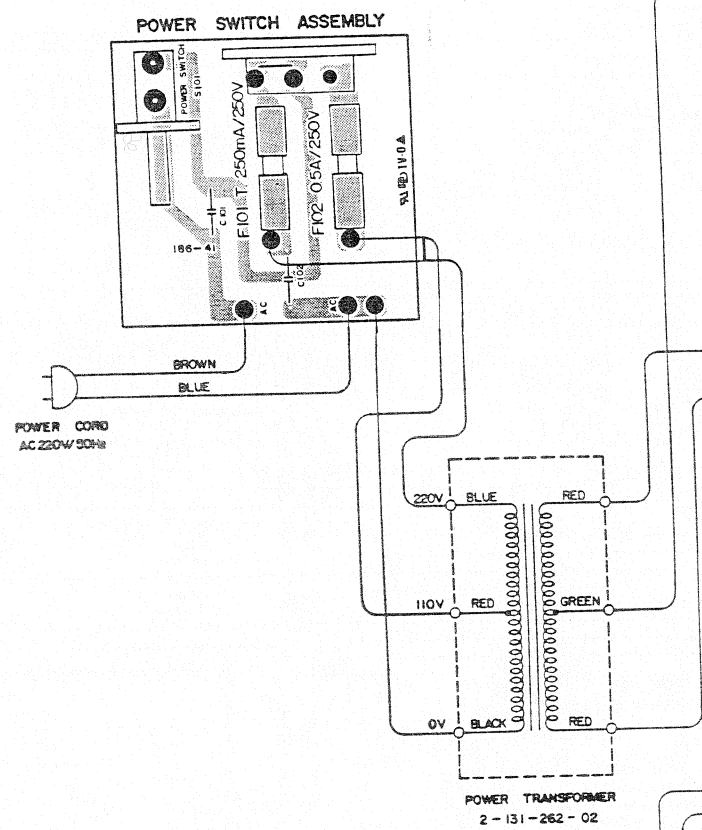
16. MONO

The sound from the L channel and R channel is mixed, and heard from both left and right speaker systems. Apart from playing back monaural sources, this switch is useful for checking the phase of the speaker system and volume balance.

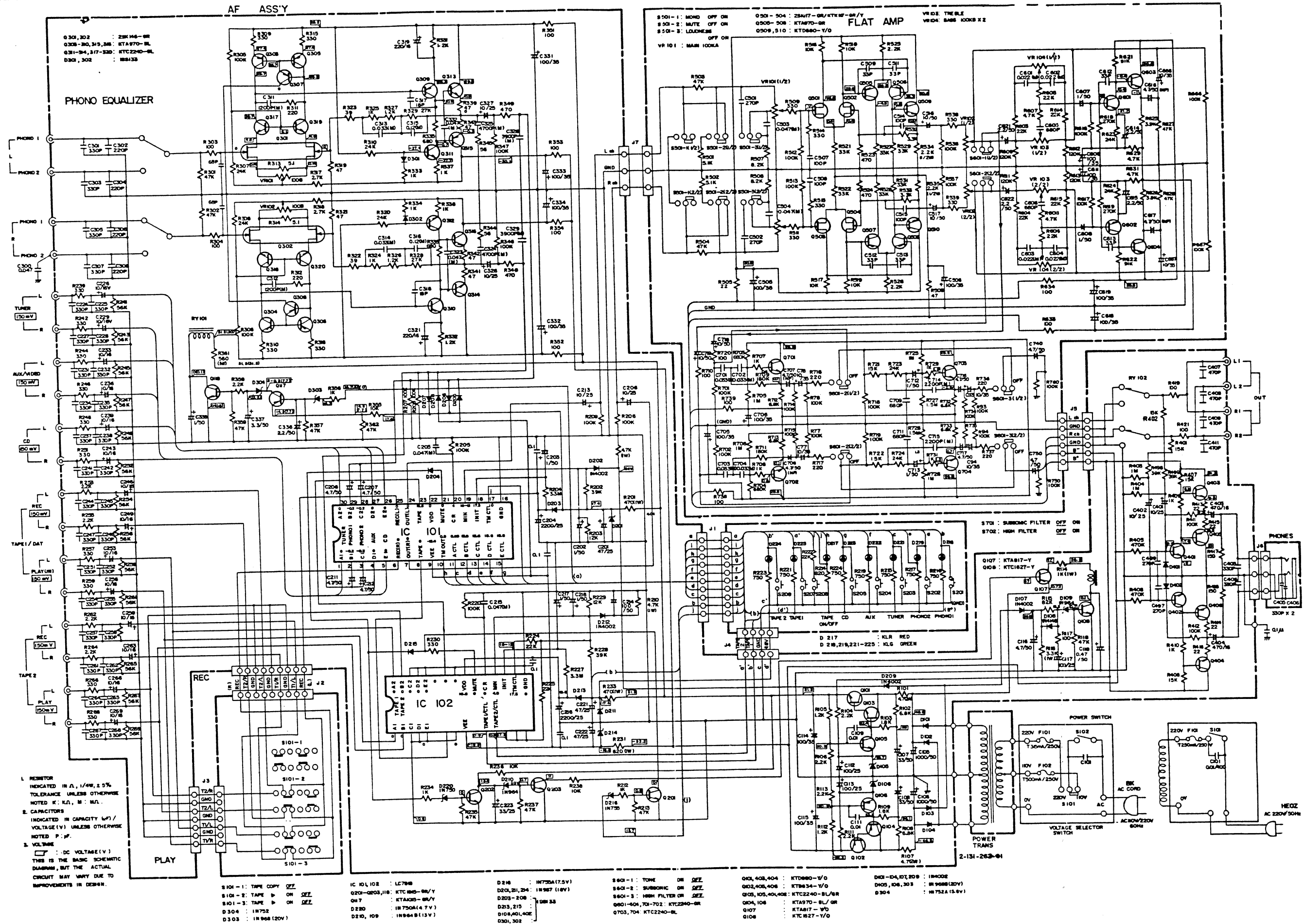
BLOCK DIAGRAM



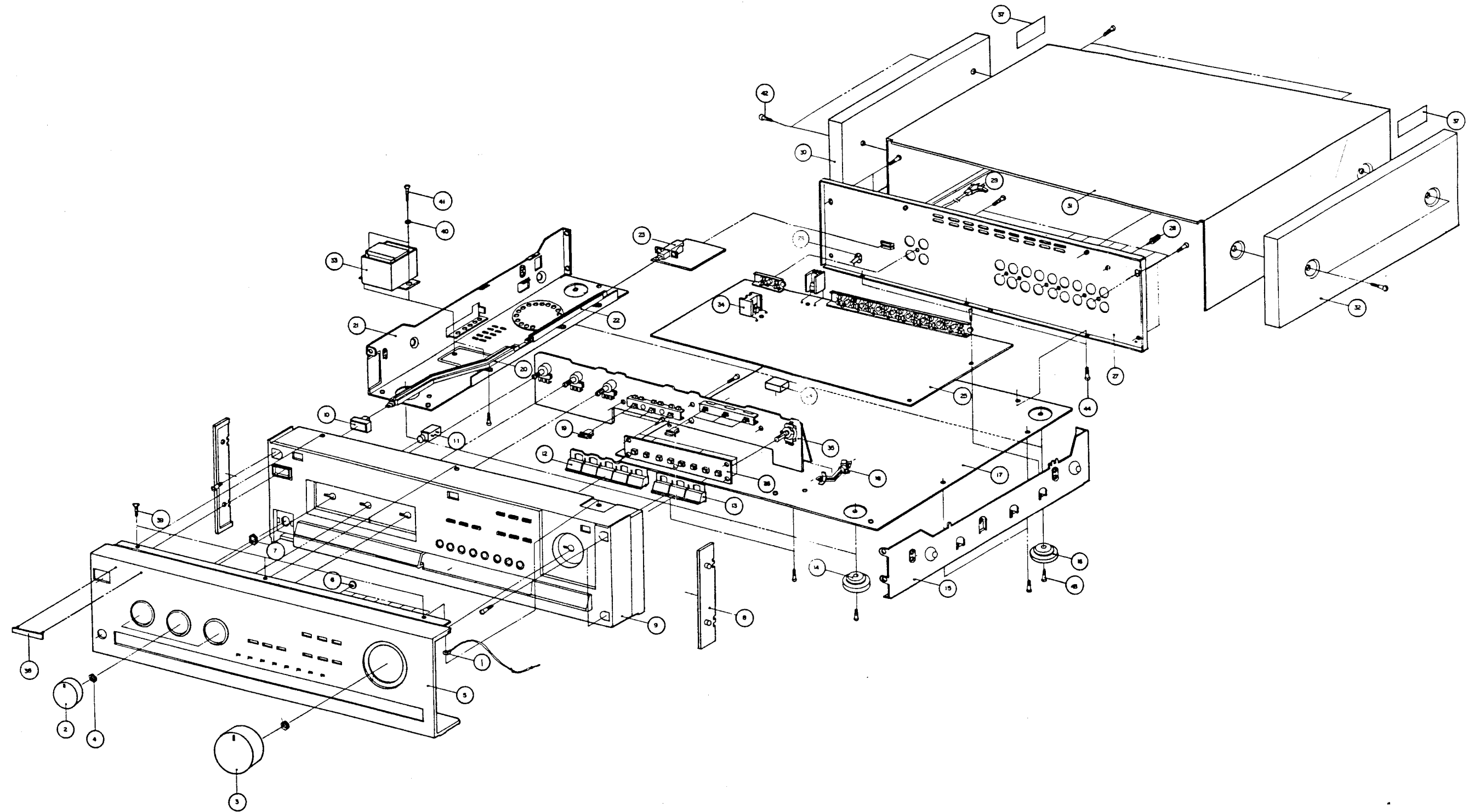
WIRING DIAGRAM



SCHEMATIC DIAGRAM



EXPLODED VIEW



ELECTRICAL PARTS LIST

Notes: When ordering parts, first convert Resistance value into Code from as shown in the following examples.

RESISTORS:

1114 □□□ 25 Carbon Film Resistor, $\pm 5\%$, 1/4W, Tapping
 ex) Resistor Value
 4.7 479 56 560 680 681
 8.2K 822 12K 123 220K 224

ELECTROLYTIC CAP.:

142 □□□□ 65 Electrolytic Capacitor, $\pm 20\%$, Tapping
 ex) Working Voltage
 16V 3 25V 4 35V 5
 50V 6 63V 7 6.3V 1

CERAMIC CAP.:

1886 □□□ 41 Ceramic Capacitor, SL, $\pm 5\%$, Non-Tapping.
 ex) CKD YB 716 CKD YF ... 756 CCD CH 806
 CCD SL 886 CCD RH ... 846 CCD TH 866
 Capacitor Value
 4PF 040 47PF 470 220PF 221
 1800PF... 182 0.01 μ F 103 0.047 μ F.... 473
 Tolerance
 C = ± 0.25 pF... 0 D = ± 0.5 pF... 1 F = ± 1 pF.... 2
 J = $\pm 5\%$ 4 K = $\pm 10\%$ 5 Z = +80 9
 -20 9

MYLAR CAP.:

1506 □□□ 51 Mylar Capacitor, Standard, $\pm 10\%$, Non-Tapping
 ex) Capacitor Value
 0.0015 μ F 152 0.027 μ F ... 273 0.1 μ F 104
 Tolerance
 J = $\pm 5\%$... 4 K = $\pm 10\%$ 5

STYROL CAP.:

1536 □□□ 41 Styrol Capacitor, $\pm 5\%$, Non-Tapping
 ex) Capacitor Value
 430 pF 431 1800pF ... 182

Miscellaneous Parts
P.C Board Assemblies

REF. NO.	PARTS NO.	DESCRIPTION
	A17A18602	CONTROL ASS'Y
	A17A18602	CONTROL ASS'Y

AF ASSEMBLY

SEMICONDUCTORS

REF. NO.	PARTS NO.	DESCRIPTION
IC101, IC102	244132472	IC, LC7818
Q301, Q302	240410511	F.E.T. 2SK 146-GR
Q102, Q405, Q406	240110321	TR, KTB834-Y
Q101, Q403, Q404	240310621	TR, KTD880-Y
Q104, Q106, Q303	240011425	TR, KTA970-BL
Q304, Q305, Q306		
Q307, Q308, Q309		
Q310, Q315, Q316		
Q108	240210921	TR, KTC1627A-Y
Q311, Q312, Q313	240211825	TR, KTC2240-BL
Q314, Q317, Q318		
Q319, Q320		
Q103, Q105, Q401	240211825	TR, KTC2240-GR
Q402		
Q118, Q201, Q202	240211135	TR, KTC1815-GR
Q203		
Q117	240011831	TR, KTA1015-GR
Q107	240010421	TR, KTA817A-Y
D108, D203, D204	241017995	DIODE, ISS133
D205, D206, D207		
D208, D213, D215		
D301, D302, D401		
D402		
D101, D102, D103	241315111	DIODE, 1N4002
D104, D107, D202		
D209, D212		
D201, D211, D214	242118031	ZENER DIODE, 1N967B, 18V
D105, D106, D303	242120031	ZENER DIODE, 1N968B, 20V
D109, D210	242113031	ZENER DIODE, 1N964B, 13V
D216	242107541	ZENER DIODE, 1N755A, 7.5V
D220	242104731	ZENER DIODE, 1N745A, 4.7V
D304	242105651	ZENER DIODE, 1N752A, 5.6V

OTHERS

REF. NO.	PARTS NO.	DESCRIPTION
RY101, RY102	214011401	RELAY
	215550301	4P, PIN JACK
	215550401	6P, PIN JACK
VR101, VR102	254110101	SEMI, F. RESISTOR
CN105	215857801	CONNECTOR, 3P
CN104	215857901	CONNECTOR, 4P
CN108	215858101	CONNECTOR, 6P
CN103	215858201	CONNECTOR, 7P
CN102	215858401	CONNECTOR, 9P
CN101	215858501	CONNECTOR, 10P
CN106	216812201	WAFER, 3P
C101	199810401	
	213126202	POWER TRANSFORMER
F101	218862101	T250mA/250V
S101	220221001	POWER SWITCH
	221110901	AC, POWER CORD
	289960101	EARTH WIRE

CAPACITORS

REF. NO.	PARTS NO.	DESCRIPTION
C202, C203, C217	142601065	ELEC. CAP, CEA, 1, 50V
C218, C338		
C336	142622965	ELEC. CAP, CEA, 2.2, 50V
C337	142633965	ELEC. CAP, CEA, 3.3, 50V
C116, C207, C208	142647965	ELEC. CAP, CEA, 4.7, 50V
C211, C212		
C226, C229, C233	142310065	ELEC. CAP, CEA, 10, 16V
C236, C239, C243		
C246, C249, C253		
C256, C259, C263		
C266, C269, C326		
C327		
C201, C221, C222	142447065	ELEC. CAP, CEA, 47, 25V
C117	142310165	ELEC. CAP, CEA, 100, 16V
C112, C113	142410165	ELEC. CAP, CEA, 100, 25V
C114, C115, C331	142510165	ELEC. CAP, CEA, 100, 35V
C332, C333, C334		
C107, C108	142633061	ELEC. CAP, CEA, 33, 50V
C319, C321	142322161	ELEC. CAP, CEA, 220, 16V
C105, C106	142610261	ELEC. CAP, CEA, 1000, 50V
C204, C216	142422261	ELEC. CAP, CEA, 2200, 25V
C403, C404	142347161	ELEC. CAP, CEA, 470, 16V
C223	142433065	ELEC. CAP, CEA, 33, 25V
C206, C213, C401	142410065	ELEC. CAP, CEA, 10, 25V
C402		
C214	142610161	ELEC. CAP, CEA, 100, 50V
C118	142647865	ELEC. CAP, CEA, 0.47, 50V
C317, C318	188618045	CERAMIC CAP, CCDSL, 18J
C109, C111	188610345	CERAMIC CAP, CCDSL, 103J
C302, C304, C306	188622145	CERAMIC CAP, CCDSL, 221J
C308		
C224, C225, C227	188633145	CERAMIC CAP, CCDSL, 331J
C228, C231, C232		
C234, C235, C237		
C238, C241, C242		
C244, C245, C247		
C248, C251, C252		
C254, C255, C257		
C258, C261, C262		
C264, C265, C267		
C268, C301, C303		
C305, C307		
C407, C408, C409	188647145	CERAMIC CAP, CCDSL, 471J
C411		
C497	188627145	CERAMIC CAP, CCDSL, 271J
C499	188627141	CERAMIC CAP, CCDSL, 271J
C300	175647355	CERAMIC CAP, CKDYF, 473K
C311, C312	150612241	MYLAR CAP, CQMA, 122J
C328, C329	150639241	MYLAR CAP, CQMA, 392J
C313, C314	150633341	MYLAR CAP, CQMA, 333J
C205, C215, C322	150647341	MYLAR CAP, CQMA, 473J
C323		
C315, C316	150612441	MYLAR CAP, CQMA, 124J
C324, C325	150647241	MYLAR CAP, CQMA, 472J

RESISTORS		
REF. NO.	PARTS NO.	DESCRIPTION
R116	113133223	METAL OXCIDE, 3.3K, 1W
R101, R107	113247923	METAL OXCIDE, 4.7, 2W
R201, R233	113147123	METAL OXCIDE, 470, 1W
R361	113156123	METAL OXCIDE, 560, 1W
R231	113182123	METAL OXCIDE, 820, 1W
R114	113110223	METAL OXCIDE, 1K, 1W
R210	113147223	METAL OXCIDE, 4.7K, 1W

CONTROL ASSEMBLY		
SEMICONDUCTORS		
REF. NO.	PARTS NO.	DESCRIPTION
Q501, Q502, Q503	240410441	F.E.T. KTK117-BL
Q504		
Q505, Q506, Q507	240011411	TR, KTA970-GR
Q508		
Q601, Q602, Q603	240211811	TR, KTC2240-GR
Q604, Q701, Q702		
Q703, Q510	240310621	TR, KTD880-Y
Q704	240211821	TR, KTC2240-BL
D217	241912101	LED, KLR114E
D218, D219, D221	241902101	LED, KLG114E
D222, D223, D224		
D225		
OTHERS		
REF. NO.	PARTS NO.	DESCRIPTION
VR102	250117201	BALANCE
VR101	250117301	MAIN
VR103, VR104	250121301	TONE
S101	220233301	
S501	220233201	
S601	220233401	
S201, S202, S203	220899901	TACT SW
S204, S205, S206		
S207, S208		
	215550901	PHONE JACK
	215911401	CONNECTOR ASS'Y, 3P

CAPACITORS		
REF. NO.	PARTS NO.	DESCRIPTION
C607, C608, C712	142601061	ELEC.CAP, CEA, 1, 50V
C713		
C614, C621, C622	142622961	ELEC. CAP, CEA, 2.2, 50V
C615		
C740, C750	142647961	ELEC. CAP, CEA, 4.7, 50V
C516, C517, C718	142610061	ELEC. CAP, CEA, 10, 50V
C719		
C505, C506, C609	142510161	ELEC. CAP, CEA, 100, 35V
C611, C618, C619		
C705, C706		
C616, C617, C707	145547961	ELEC. CAP, CEA, 4.7, 35V
C708, C716, C717		
C77, C78, C93,	142610061	ELEC. CAP, CEA, 10, 35V
C94, C666, C667		
C509, C511, C512	188633041	CERAMIC CAP, CCDSL, 33J
C513, C612, C613		
C507, C508, C514	188610141	CERAMIC CAP, CCDSL, 101J
C515		
C501, C502	188627141	CERAMIC CAP, CCDSL, 271J
C605, C606	188668141	CERAMIC CAP, CCDSL, 681J
C709, C711	188668141	CERAMIC CAP, CCDSL, 681J
C601, C602, C603	150622341	MYLAR CAP, CQMA, 223J
C604		
C701, C702, C703	150633341	MYLAR CAP, CQMA, 333J
C704		
C714, C715	150622241	MYLAR CAP, CQMA, 222J
C503, C504	150647341	MYLAR CAP, CQMA, 681J

PARTS LIST EXTERIOR

NO	PARTS NAME	PARTS NO.	MATERIAL	Q'TY
1	EARTH WIRE	289930701	—	1
2	KNOB ASS'Y, ROTARY	311481701	AI + ABS	3
3	KNOB ASS'Y VR	311481801	AI + ABS	1
4	NUT	311607002	—	4
5	PANEL, FRONT	311510101	AI	1
6	LENS, INDICATOR	311091801	PMMA	8
7	NUT, JACK MIC	711312009	—	1
8	DECORATION, SIDE	311480501	ABS	2
9	PANEL, BASE	311480301	ABS	1
10	KNOB, POWER	364030101	ABS	1
11	PHONE, JACK	215550901	—	1
12	KNOB, TACT STATION(A)	311481501	ABS	1
13	KNOB, TACT STATION(B)	311481601	ABS	1
14	FOOT ASS'Y	311481001	AI + TPR	2
15	FRAME, SIDE (R)	331622401	SECC	1
16	FOOT	311480801	TPR	2
17	COVER, BOTTOM	331622501	SECC	1
18	JOINT, P.C.B	364032111	MYLON 6	2
19	KNOB, PUSH	331093502	ABS	9
20	JOINT, POWER	381070501	ABS	1
21	FRAME, SIDE(L)	331622301	SECC	1
22	JOINT, POWER	381030301	ABS	1
23	POWER, S/W	217018641	—	1
24	CUSHION	311510501	EVA	1
25	MAIN, P.C.B	A17018501	P.C.B	
26	BUSHING, STRAIN R/F	820111501	NYLON	1
27	PANEL, REAR	311510201	SECC	1
28	TERMINAL, EARTH	215570501	—	1
29	CORD POWER(AC)	221110901	—	1
30	BOARD SIDE (L)	311481201	MDF	1
31	BONNET	311480601	PVC+SECC	1
32	BOARD SIDE (R)	311481101	MDF	1
33	TRANS	213126202	—	1
34	HEAT SINK	331204501	A1	2
35	CONTROL P.C.B	217016611	P.C.B	1
36	FUNCTION S/W ASS'Y	217018631	P.C.B	1
37	SHEET, SIDE	311472701	PVC	2
38	BADGE	321410401		1
39	SCREW	746440801		3
40	WASHER	702005003		2
41	SCREW	776840601		2
42	SCREW	776842001		4
43	SCREW	776441001		8
44	SCREW	776440601		30